

KickSat: A Crowd-Funded Technology Demonstration Mission for the Sprite ChipSat

Completed Technology Project (2012 - 2013)



Project Introduction

KickSat is a cubesat technology demonstration mission designed to demonstrate the deployment and operation of prototype sprite "ChipSats" (femtosatellites) developed at Cornell University. Sprites like the KickSat represent a disruptive new space technology that is enabling new classes of space science missions while having the potential to open access to space students and the wider Maker Community. The KickSat mission was initially financed through the crowdfunding website Kickstarter, with the goal of reducing the total cost of putting a single satellite into low Earth orbit to a few hundred dollars. Design and development of the 3U cubesat enclosure "mothership" that houses and deploys the sprites was performed in collaboration with private Makers at the NASA Ames SpaceShop with the support of the NASA Ames Office of the Chief Technologist. The avionics portion of the 3U mothership was based upon the PhoneSat 2.5 architecture. The KickSat sprite is a 3.2 by 3.2 cm spacecraft that includes solar cells, gyroscopes, and hybrid communication-microcontroller system on a millimeters thick printed circuit board. It is intended as a general-purpose sensor platform for micro-electro-mechanical (MEMS) and other chip-scale sensors with the ability to downlink data to HAM radio operated ground stations from low earth orbit. The original KickSat was a 3U cubesat built to carry and deploy sprites into space. It was launched on the CRS3 SpaceX Falcon 9 on 18-April 2014. On 21-April-2014 the KickSat's PhoneSat based avionics control system suffered an electrical anomaly that reset the deployment timer to eject the sprites at a time past the predicted re-entry time. On 14-May-2014 the KickSat mothership and undeployed sprites reentered in otherwise perfect condition.

Anticipated Benefits

N/A



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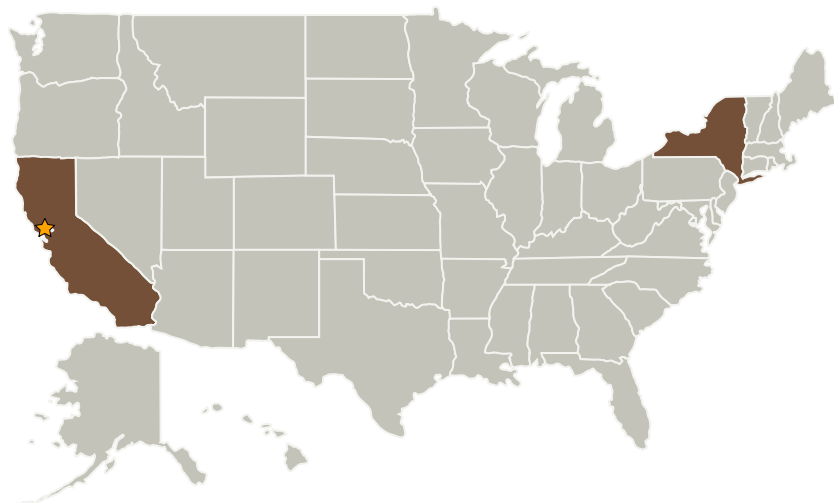
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Cornell University	Supporting Organization	Academia	Ithaca, New York

Primary U.S. Work Locations

California	New York
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Stories

1676 Review (17536)
<https://techport.nasa.gov/file/8762>

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

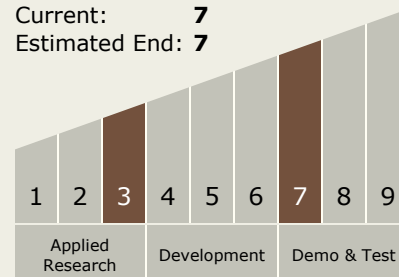
Harry Partridge

Principal Investigator:

Zachary R Manchester

Technology Maturity (TRL)

Start: **3**
 Current: **7**
 Estimated End: **7**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.2 Descent
 - └ TX09.2.1 Aerodynamic Decelerators